

TN

405

G74

G9

This is a reproduction of a library book that was digitized by Google as part of an ongoing effort to preserve the information in books and make it universally accessible.

GoogleTM books

<https://books.google.com>



The University of Chicago
Libraries



REPORT

OF THE

Arigna Iron-Works,

IN
IRELAND.

BY
THOMAS GUEST,

OCTOBER, 1804.

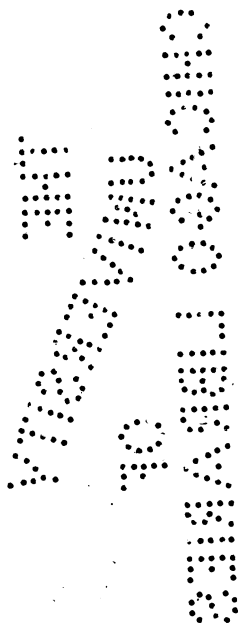
DUBLIN:

PRINTED FOR MARTIN KEENE,

6, COLLEGE-GREEN,

1810.

TN405
G74 G9



REPORT, &c.

THESE Works are situated in the County of Roscommon, on the west side of Loch Alleyn, and within about a mile of it; they are on the west side of the River Arigna, and at the south end of the Mountain called Brahlieve, agreeable to the description I had been given thereof, on which Mountain are several veins of Iron-stone already open at the distance of about a mile from the works; but the principal veins or strata which I saw were by the side of the River, and had been lately worked by the inhabitants; there are three stratas of Iron-stone at a place called Altagowlan, on the east side of Arigna, that may be worked to advantage, being, as I was informed, on the same Lordship; yet as they lie at the distance of about two miles from the Works, the expence of carriage will be greater in proportion. There are also other stratas near the top or south end of the Mountain (Brahlieve) above the works, and I doubt not but others may be found near the Works. A very considerable quantity of Iron-stone may also be raised at the Iron mountain on the east side of Loch Alleyn, (from whence, it seems most probable, the charcoal furnace which has been carried on near Drimshambo must have been supplied) and from the distance, I estimate the expence of raising and carriage to Arigna, will be about 7s. 6d. per ton. The Iron-stone has hitherto been raised and delivered at the Furnace by the tenants, at 3s. 8d. per ton of 20 hundred weight of 112 pounds, but when an extra quantity comes to be wanted and the consumption regular, a greater quantity of Mine Works must be

A 2 opened,

opened, Levels drove, and Roads made. The Iron-stone will cost nearly double the present price, say 6s. per ton, in a short period of time.

There is only one vein of Coal yet found on this Mountain, which has been tried to make Iron with, and whether there is any other or not is yet uncertain; it has been raised at a place called Aughabehe, by means of pits without a level, some of which are now open, but are so full of water as to prevent them from being worked. A level has also been drove at a very considerable depth below the vein, the distance of about two hundred yards; this level it is said is within ninety yards of the water-drawing pit, but from being injudiciously done, part of it is fallen in; it is at present full of water and rubbish, and it is doubtful whether it will ever be rendered serviceable, at least not for many years, as if drove to the extent, it would be about seven hundred yards beyond the water-pit: upon the whole it will be necessary to drive a new level at a less depth below the vein, so as to strike the vein about eighty yards beyond the present working; which will gain sufficient breadth for the present, and by driving the same under the water-drawing pit, and boring from thence to the level, the water may be let out of the present Colliery, and the old works carried on farther. The expence of driving this new level, I estimate to be about 5 or 600*l*. and by laying dram plates therein, the Coal may be brought out without the expence of winding up pits. Not having seen any of this Coal, I can say nothing with respect to its quality, but as an indication of its goodness, I saw some good grey melting Iron at the works which was made therefrom. There are also two pits lately sunk upon the Brahlieve Mountain, at a place called the Rover; the second pit was sunk upon a fault. The vein, when first discovered at the bottom of the pit, was not 2 feet thick, but on drifting to the deep a few yards, it increased to 2 feet 3½ inches, which work at present yields very little water. This vein may probably turn out to be the same as that at Aughabehe, notwithstanding it at present deeps in a contrary direction.

It is advisable to drive a level to this Coal also, as it would be highly imprudent to have a work dependant on one level; for should any accident happen by a fall on the road, &c. the whole works may be put to a stand; when if there were two or three levels, it may be supplied while the other is repairing, and the Coal may be then brought out as described for the Aughabehé Colliery. With respect to this Coal, about two-thirds of it may be coked in the open air: but as the other part is quite small, it will be necessary to have a quantity of ovens to coke it in; and even then this small Coal being mixed with slate, will not be of so good a quality or so fit for the furnace as the other; which I understood was the case with Aughabehé Coal. I have seen some of the Rover Coal coked and used in the cupelo; it melted the Iron very quick and well, which I consider is a symptom of its good quality, and from what I could judge, have little reason to doubt its answering the purpose of making Iron, especially that part of it which can be coked in the open air. The cost of raising this Coal and delivering it at the furnace bank, I estimate at 6s. 4d. per ton.

The Lime-stone being at the distance of two miles, has formerly been carried and delivered at the furnace, at 2s. 3d. per ton; the price of carriage of which may probably advance as the consumption becomes regular and the provender scarcer to keep horses in the winter. Sand lies at a still greater distance, costs at present 5s. per ton, and will be subject to the like inconvenience to get it carried. Having stated the situation of the Iron-stone, Coal, Lime-stone and Sand, I have now to say, that the works consist of a blast furnace, 44 feet high, 12 feet wide on the bosh; the furnace bank being nearly level with the Bridge-house and Tunnel-head, the materials have been thrown into the furnace out of wheel-barrows; upon which bank there are three Kilns for calcining the Ore previous to its being thrown into the furnace. The furnace has been blown by an over-shot water-wheel, 26 feet diameter, and two cast iron cylinders, 7 feet diameter, worked by cams upon the pistons with poisebeams. To the other end of the shaft

is fixed the boring-mill. The water hitherto used being only the droppings from Brahlieve Mountain, having been found insufficient, a double steam-engine has been erected on Bolton and Watt's construction, its steam cylinder 32 inches diameter, not cased, its blowing cylinder 5 feet 4 inches, to assist the water-wheel, but having been injudiciously completed is now quite out of repair, and the beams being broke, it will require a new one before it can again be put to work ; and I apprehend there must be a new air-pump and condenser, the present ones being too small in proportion to the size of the cylinder, and supposing the engine in complete repair, the expence of coal to work it, oil, hemp, grease, wear and tear, and labour would be excessive ; it will therefore be adviseable to cut a new level to bring the Arigna water into the furnace pool, which by the best information I could get, will be more than sufficient to work two furnaces. The expence of doing this, I presume, will be about 1000*l*. The water thus brought by widening the sole of the water-wheel and adding some cog-wheels and a fly thereto, I think may be so contrived with the present blowing cylinders, by putting piston-rods and casting tops to them ; taking away the poise-beams, and working with a crank a double stroke, to blow a sufficient quantity of blast for two furnaces ; in which case three more mine-kilns should be erected, and another furnace. The building of the boring-mill may answer the purpose for part of the cast-house, and the boring-mill attached to some other part of the premises. There is also a foundry with two cupelos, potting-shops, and warehouses for casting small castings, and in the cast-house there is a crane and an air-furnace for the purpose of making large castings ; these are tolerably well adapted for carrying on the casting business. There is also a horse-mill for grinding clay by the old method of stone on edge and a kiln erected for burning brick. This kiln is much too small, and the drying-room must be altered into a stove to make brick in all weathers.

THE LOWER WORKS

Are, a Pond calculated to receive the water from the tail of the Furnace-wheel, below which there is a Forge where has been a refining-hearth worked by an overshot wheel of sixteen feet diameter, with three cranks on its axis working three cylinder bellows, each thirty inches in diameter, where has also been a shingling hammer worked by an overshot wheel of thirteen feet diameter, four feet eight inches broad, and two air-furnaces, the one having been used as a Puddling-furnace, the other as an Air-chaffery, the stacks of which only are remaining.

A Slitting-mill, where has been two overshot water wheels of twenty-two feet diameter: there is one pair of Rolls and Cutters; the cog-wheels being made of wood, with wooden cogs, from the length of time since they have been worked, must be nearly decayed. The water-wheels are all down except one, and this one from being exposed to the weather and not being used, can be little better, the shafts only appearing to be good. This Forge is ill adapted to the present improved method of making Bar Iron, as such, very few if any of the shafts will come into use.

There are also some Workmen's houses, and two houses for Agents, the largest of which is too small for a man who has a family, there being only two small Parlours, a Kitchen, and three Bed-rooms; the situation thereof is also extremely bad, being built upon a level with the Coke-yard, it will be at times so annoyed by the smoke from the Coke-hearts and works that it will be hardly possible to live in it. I would therefore recommend a house for the Manager of those works to be built on the flat meadow on the other side of the Arigna; the bridge over the river being repaired, he would then be very near the works; and by putting the front of the house towards the works, he would have a view of what was going forward at all times.

I have now to take notice of the present buildings,
machinery,

machinery, clerks' and workmen's houses, &c. &c. (exclusive of the stock of iron-stone, coal, and lime-stone and other articles, as tools, &c.) with the valuation thereof; which I set down at 20,000/. The expence of making it a complete work, viz. cutting the water-course from the Arigna to the furnace-pool, altering the blowing machine, widening the sole of the wheel, and putting iron ladles on, making and fixing a large cog-wheel of iron on the shaft with two other iron shafts and cog-wheels to work a fly-wheel, timber for framing, cast iron for standards and riders, &c. iron for bolts, widening the present wheel-pit, and altering the fly wheel-pit, a crank with two cast iron lever beams to work the pistons, piston rods (turned), cast iron tops to the present cylinders, with air-boxes and pipes to carry the blast, with pins, bolts, &c. building three mine-kilns, a new furnace, bridgehouse, coke-ovens, driving levels to the collieries, opening coal and mine works, making roads, drilling blocks of stone to lay the rails upon, dram rails, drams with wrought iron axles and cast iron wheels to carry the coal and iron-stone to the works; coke-barrows, wheel-barrows, and cast iron wheeling-plates, to wheel the rubbish from the mine works, colliers' and miners' tools, tools of all kinds for the founders, fillers, cokers, barrow-fillers, mine-burners, bridge-stockers, cinder-wheelers, &c. &c. with a stock of iron-stone, coal, and lime-stone to begin: for the upper works.

AND FOR THE LOWER WORKS.

Making fineries, puddling-furnaces, bloom-furnaces, new water-wheels, cog wheels and fly-wheels, beds, standards, spindles, nutts, coupling boxes, different sets of rolls for rolling iron, cast iron plates for the floors, a planishing forge, boring-mill and mill for turning rolls, with tools and implements for making bar iron, boiler-plates, nail rods, or hoops, if the iron, on trial, be found to answer for such purposes, which if a little more of the coldshort iron ore can be found, I think it may. These expences together with
a new

a new house for the Manager, and an additional quantity of workmen's houses will cost nearly 20,000*l*.

I must be excused saying any thing respecting the consumption, demand, conveyance, or market; being a stranger thereto, of which you say there is plenty of demand, and the greater part, if not all, would be fetched from the works. This being premised, I have now to say that I have not the least doubt of the works turning out to a good account, as will appear by the following estimates, and to convince you of the reality thereof I should have no objection to hold a share in the concern.

Estimate of making a Ton of Pig and Bar Iron,
at Arigna.

	£.	s.	d.	£.	s.	d.
5 Tons of raw Coal, at 6 <i>s</i> . 4 <i>d</i> .	£.	s.	d.	£.	s.	d.
per Ton, - - - - -	1	11	8			
4 Tons of Iron-stone, at 6 <i>s</i> . per						
Ton, - - - - -	1	4	0			
1 Ton of Lime-stone, at 4 <i>s</i> .	0	4	0			
Working the Furnace, calcining,						
coking, &c. - - - - -	0	10	0			
For timber and wrought iron						
work for drams, barrows, tools,						
nails, steel, oil, leather, brags,						
black-lead, grease, sand, clay,						
repairs, wear and tear of ma-						
chinery, rent, agencies, and						
other incidental charges, -	1	5	4			
Ton of Pig Iron, —————				4	15	0
24 Cwt. of Pig-Iron, at 96 <i>s</i> . to a						
Ton of Finer's metal, - - -	5	14	0			
Refining, - - - - -	0	3	6			
Cokes, castings, bar iron for tools,						
wear and tear, &c. - - - -	0	10	0			
Ton of Finer's metal, —————				6	7	6
24½ Cwt. of Finer's metal, at						
6 <i>l</i> . 7 <i>s</i> . 6 <i>d</i> . per Ton, - - -	7	16	2			
Puddling, - - - - -	0	12	0			
Coal, 2 Tons, at 6 <i>s</i> . 4 <i>d</i> . - -	0	12	8			
Wheeling ashes, weighing charges,						

rolling,

rolling, unloading coal, master £. s. d. £. s. d.
 pudler's wages, bricks, sand,
 clay, repairing offices, castings,
 weighing pudled bars, tools,
 incidental charges, and wear
 and tear, - - - 0 19 2

Ton of Pudled Bars, ——— 10 0 0

23½ Cwt. of Pudled Bars, at

10l. per Ton, - - - 11 15 0

Piling and heating, 3s. 6d. rolling,

3s. 6d. - - - 0 7 0

Coal, 25 Cwt. at 6s. 4d. per Ton, 0 7 11

Repairing Furnaces, sand, brick,

castings, streightening, weigh-

ing bars and other labour,

wear and tear of machinery,

grease, and incidental expences, 0 18 1

Ton of Bar Iron, ——— 13 8 0

I have now to remark (having been told by one of the Iron Founders in Dublin) that the price of best Foundry dark grey iron is now sold at the Works in Scotland at 8l. 5s. per Ton, ordinary 7l. 5s. and bright 6l. 5s. from whence the Foundries in Dublin get supplied, and supposing the iron could not be sold at the Works, I conceive the best method to get it to market would be to carry it to Sligo: the expence of taking it there; weighing and wharfage would not exceed 15s. per Ton. The guide I have for this is as follows: Prior to our having a canal made from Merthyr to Cardiff, we were in the habit of carrying our iron on horses backs over the hills, being the distance of twenty-four miles for 13s. per Ton; and, if I am rightly informed, the distance from Arigna to Sligo is only eighteen miles, from whence I apprehend they may be conveyed to most Ports in Ireland as cheap as they can from the works in Scotland. But for the certainty thereof I must leave those to judge who are better acquainted with the situation of the place: admitting this correct, and the two furnaces were to make sixty Tons per week, for fifty-two weeks would be 3120 Tons.

Tons. The profits arising from the works if the whole were sold in pigs, would be as follows :

Say the one-half was inferior Iron, then there would be

1560 Tons of best dark grey, at	£.	s.
8l. 5s. per Ton, - - -	12870	0

1560 Do. of inferior, at the medium between the two sorts,		
6l. 15s. per Ton, - - -	10530	0

23400 0

Making 3120 Ton, at 4l. 15s. per Ton, - - - - - £.14820

Carriage of the above to Sligo, at 15s. per Ton, - - - - - 2340

17160 0

6240 0

If there could be 4 Tons per week sold in castings, you would have to add a profit of 5l. per Ton on 208 Tons of castings, -

1040 0

Which would make a profit of 7280 0

If the Iron were not to be sold in Pigs, then you would have to say that 3120 Tons of Pig-Iron will produce 1806 Tons of Bar-Iron at the rate of 35 Cwt. of Pigs to make a Ton of Bars, agreeable to the before-mentioned estimates.

Then 1806 Tons of Bar-Iron sold at the works, at 17l. 5s. (This is the price as reduced by Messrs. Blair and Co. but at towns on the road between Dublin and Arigna, the Smiths pay 24l. per Ton,

31153 10.

Making 1806 Tons of Bars, at 13l. 8s. per Ton, - - - - -

24200 8

6953 2

A part of this may be rolled into Bolts and five-eighths squares, you will there-

fore

fore have to add 2l. per Ton more for the quantity of Iron which may be made of these sizes, say 70 Tons, at 40s.

£. s.

140 0

 7093 2

If the Iron will answer for hoops, I presume a large quantity may be sold. The present prices of these are 28l. per Ton, and it was till lately sold at 38l. per Ton, by the Ironmongers in Dublin. Say the rolling into hoops cost 5l. per Ton more than Bars; the difference between the price of making and the reduced price they are now for, would be 9l. 12s. per Ton.

(These calculations, as far as respect the manufacturing, are made according to the price of labour given in this country. Therefore so much as the price of labour can be reduced at Arigna, it will increase the profits.)

If the sudden fall of Bars, which had only taken place by Messrs. Blair and Co. should not be likely to continue, then the extra price, which it can be sold for will be to be added to the calculations, viz.

Suppose Bar-Iron to be sold at the works at 20l. per Ton, the usual price it is sold at in Dublin, then the profit on 1806 Tons, at 6l. 12s. per Ton will be 11912 12

THOMAS GUEST,

Dowlais Iron Works, Glamorganshire.

MARCH 1st. 1805.

F I N I S.

Gaylord Bros.
Makers
Syracuse, N. Y.
PAT. JAN 21, 1908

1- 1187

TN		
405	Guest	
G14	Report of the Brigna	
G9	iron - works	
	1-	1187

TN405.G74G9 c.1

Report of the Arigna ironworks in Ir



086 448 969

UNIVERSITY OF CHICAGO